

What is claimed is:

1. A dielectric coating for use on a conductive substrate comprising:

a silicone composition of the formula:

$[\text{RSiO}_{(4-x)/2}]_n$  wherein  $x=1-4$  and wherein R comprises a compound selected from the group consisting of: methyl, phenyl, hydrido, hydroxyl, alkoxy groups or a combination of the above or monovalent radicals independently selected from alkyl, aryl, alylamide, arylamide, alkylamino groups and arylamino radicals (when  $1 < x < 4$ );

said dielectric coating having a network structure.

2. The dielectric coating of Claim 1 wherein the silicone composition comprises a silsesquioxane compound of the formula:

$[\text{RSiO}_{3/2}]_n$  wherein R comprises a compound selected from the group consisting of: methyl, phenyl, hydrido, hydroxyl, alkoxy or a combination of the above or monovalent radicals independently selected from alkyl, aryl, alylamide, arylamide, alkylamino groups and arylamino radicals (when  $1 < x < 4$ ) (when  $1 < x < 4$ ).

3. The dielectric coating of Claim 2 wherein the silsesquioxane compound further includes silanol units of the formula:  $[\text{Rsi}(\text{OH})_x\text{O}_y]$  where  $x+y=3$  and which can be silylated with appropriate organosiloxanes to produce corresponding silylated polysilsesquioxanes.

4. The dielectric coating of Claim 1 wherein the silicone composition comprises a polymethyl silsesquioxane of the formula:



5. The dielectric coating of Claim 1 wherein the silicone composition comprises a silsesquioxane copolymer of the formula:

$\text{R}^1_a\text{R}^2_b\text{R}^3_c\text{SiO}_{(4-a-b-c)/2}$ , wherein: a is zero or a positive number, b is zero or a positive number, c is zero or a positive number, with the provisos that  $0.8 \leq (a+b+c) \leq 3.0$  and wherein the copolymer has an average of at least 2  $\text{R}^1$  groups per molecule, and each  $\text{R}^1$  is a functional group independently selected from the group consisting of hydrogen atoms and monovalent hydrocarbon groups having aliphatic unsaturation, and each  $\text{R}^2$  and each  $\text{R}^3$  are monovalent hydrocarbon groups independently selected from the group consisting of nonfunctional groups and  $\text{R}^1$ .

6. The dielectric coating of Claim 5 wherein  $\text{R}^1$  is an alkenyl group and  $\text{R}^2$  and  $\text{R}^3$  are nonfunctional groups selected from the group consisting of alkyl and aryl groups.
7. The dielectric coating of Claim 6 wherein  $\text{R}^1$  is selected from the group consisting of vinyl and allyl groups.
8. The dielectric coating of Claim 6 wherein  $\text{R}^2$  and  $\text{R}^3$  are selected from the group consisting of methyl, ethyl, isopropyl, n-butyl, and isobutyl groups.
9. The dielectric coating of Claim 1 wherein the silicone composition comprises a phenyl-methyl siloxane compound of the formula:



10. A substrate structure comprising:

a conductive material;

a dielectric coating disposed on a surface of the conductive material

said dielectric coating comprising a silicone composition of the formula:

$[\text{RSiO}_{(4-x)/2}]_n$  wherein  $x=1-4$  and wherein R comprises a compound selected from the group consisting of: methyl, phenyl, hydrido, hydroxyl, alkoxy groups or a combination of the above or monovalent radicals independently selected from alkyl, aryl, alylamide, arylamide, alkylamino groups and arylamino radicals (when  $1 < x < 4$ );

said dielectric coating having a network structure.

11. The substrate of Claim 10 wherein the silicone composition comprises a silsesquioxane compound of the formula:

$[\text{RSiO}_{3/2}]_n$  wherein R comprises a compound selected from the group consisting of: methyl, phenyl, hydrido, hydroxyl, alkoxy or a combination of the above or monovalent radicals independently selected from alkyl, aryl, alylamide, arylamide, alkylamino groups and arylamino radicals (when  $1 < x < 4$ ) (when  $1 < x < 4$ ).

12. The substrate of Claim 11 wherein the silsesquioxane compound further includes silanol units of the formula:  $[\text{Rsi}(\text{OH})_x\text{O}_y]$  where  $x+y=3$  and which can be silylated with appropriate organosiloxanes to produce corresponding silylated polysilsesquioxanes.

13. The substrate of Claim 10 wherein the silicone composition comprises a polymethyl silsesquioxane of the formula:



14. The substrate of Claim 10 wherein the silicone composition comprises a silsesquioxane copolymer of the formula:

$\text{R}^1_a\text{R}^2_b\text{R}^3_c\text{SiO}_{(4-a-b-c)/2}$ , wherein: a is zero or a positive number, b is zero or a positive number, c is zero or a positive number, with the provisos that  $0.8 \leq (a+b+c) \leq 3.0$  and wherein the copolymer has an average of at least 2  $\text{R}^1$  groups per molecule, and each  $\text{R}^1$  is a functional group independently selected from the group consisting of hydrogen atoms and monovalent hydrocarbon groups having aliphatic unsaturation, and each  $\text{R}^2$  and each  $\text{R}^3$  are monovalent hydrocarbon groups independently selected from the group consisting of nonfunctional groups and  $\text{R}^1$ .

15. The substrate of Claim 14 wherein  $\text{R}^1$  is an alkenyl group and  $\text{R}^2$  and  $\text{R}^3$  are nonfunctional groups selected from the group consisting of alkyl and aryl groups.

16. The substrate of Claim 15 wherein  $\text{R}^1$  is selected from the group consisting of vinyl and allyl groups.

17. The substrate of Claim 15 wherein  $\text{R}^2$  and  $\text{R}^3$  are selected from the group consisting of methyl, ethyl, isopropyl, n-butyl, and isobutyl groups.

18. The substrate of Claim 1 wherein the silicone composition comprises a phenyl-methyl siloxane compound of the formula:

